

## **Abstract**

The invention is related to a recombinant single-chain tri-specific antibody made from anti-Tumor Associated Antigen (TAA) antibody, FC interlinker, anti-CD3 antibody, HSA interlinker and anti-CD28 antibody in turn. Particularly, the invention relates to an anti-CEA, anti-CD3, anti-CD28 recombinant single-chain tri-specific antibody, CEA-scTsAb, which was constructed with three tandem antibody fragments (anti-CEA scFv, anti-CD3 scFv and anti-CD28 single-domain antibody) linked by two interlinkers (FC interlinker, HSA interlinker), and could be appended by C myc tag or histidine tag ((His)<sub>6</sub>-tag) at the C terminal. It also concerns a method for construction, expression and purification of the antibody. It also offers the encoded DNA sequence of the antibody, expression vectors and host cells for the vectors.